

(12) United States Patent Denisart et al.

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(54) CLOSED CAPSULE WITH OPENING MEANS Inventors: Jean-Luc Denisart, Cully (CH); Antoine Cahen, Lausanne (CH); Alfred Yoakim, St-Légier-La Chiesaz (CH) Assignee: Nestec S.A., Vevey (CH) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 510 days. Appl. No.: 10/875,279 (22)Filed: Jun. 25, 2004 **Prior Publication Data** (65)US 2004/0228955 A1 Nov. 18, 2004 Related U.S. Application Data (63) Continuation of application No. PCT/EP03/00384, filed on Jan. 13, 2003. (30)Foreign Application Priority Data Jan. 16, 2002 02000943 (51) Int. Cl. A47J 31/00 (2006.01)**U.S. Cl.** 426/77; 426/78; 426/79; (52)426/112; 426/433; 426/115; 99/295; 99/323 426/112, 120, 433, 115; 99/282, 297, 295, 99/307, 232; 222/541.3, 541.2; 206/0.5 See application file for complete search history. (56)**References Cited** U.S. PATENT DOCUMENTS 12/1966 Stasse 3,292,527 A 3,589,272 A * 6/1971 Bouladon et al. 99/295 3,607,297 A 9/1971 Osvaldo

4,077,551	A		3/1978	Manaresi	222/494
4,136,202	A		1/1979	Favre	
4,306,492	A	*	12/1981	Zimmermann	99/287
4,410,550	A	*	10/1983	Gaskill	426/80
4,886,674	A	*	12/1989	Seward et al	426/79

(Continued)

FOREIGN PATENT DOCUMENTS

DE 2327264 1/1975

(Continued)

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(57)ABSTRACT

The present invention relates to a capsule containing a substance for the preparation of a beverage that is designed to be extracted by injection of a fluid under pressure. The capsule comprises a closed chamber containing the substance with at least part of the closed chamber including a retaining part made of a flexible membrane. One or more raised elements that face the membrane are associated with and forming part of the capsule. These element(s) are used to open the capsule due to a buildup of pressure therein. This rise in pressure causes relative engagement of the raised element(s) with the membrane until the membrane ruptures or is torn to release the formed beverage from the chamber. As the liquid of the beverage does not come into contact with the machine, hygiene is improved and cross-contamination is reduced when preparing a beverage from the capsule.

27 Claims, 15 Drawing Sheets

